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Cover illustration: The ammonite *Dorsetensia liostraca* Buckman from the Lower Bajocian (Middle Jurassic) Giganteuston Member of Öschingen, Middle Swabian Alb, Germany. For details, see Dietze, V. et al.: The Giganteuston Member of Öschingen (Humphriesianum Zone, Lower Bajocian, Swabian Alb), with comments on the genera *Dorsetensia* Buckman, 1892 and *Nannina* Buckman, 1927, pp. 209–236 in this issue.
Back cover: Atrium of the Munich Palaeontological Museum, view from the main entrance.

Umschlagbild: *Dorsetensia liostraca* Buckman, ein Ammonit aus dem Giganteuston des Unter-Bajociums (Mittlerer Jura) von Öschingen, Mittlere Schwäbische Alb, Deutschland. Für weitere Informationen siehe Dietze, V. et al.: The Giganteuston Member of Öschingen (Humphriesianum Zone, Lower Bajocian, Swabian Alb), with comments on the genera *Dorsetensia* Buckman, 1892 and *Nannina* Buckman, 1927, S. 209–236 in diesem Heft.
Rückseite: Lichthof des paläontologischen Museums München, Blick vom Haupteingang.

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Scytophyllum waehneri (Stur) nov. comb., the correct name for *Scytophyllum persicum* (Schenk) Kilpper, 1975

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Abstract

Scytophyllum is a Triassic seed fern genus to which currently more than 28 species distributed in Eurasia are attributed. *Scytophyllum persicum* is a characteristic taxon of the Late Triassic flora of Iran and adjacent countries. Discovery of part of the original collection of the conspecific *Bernoullia waehneri* from the same area and age made a revision of this species necessary that resulted in the proposal of the new combination *Scytophyllum waehneri* (Stur) nov. comb. since *B. waehneri* has priority over *S. persicum*. *Scytophyllum waehneri* differs from all other species in *Scytophyllum* in the smaller dimensions of the fronds and pinnae and the distinct secondary veins forming a sort of fishbone structure on the lamina.

Key words: *Scytophyllum*, Rhaetian, Upper Triassic, Alborz, Iran, seed fern

Zusammenfassung

Scytophyllum ist eine Gattung triassischer Samenfarne mit 28 in Eurasien verbreiteten Arten. Ein typischer Vertreter ist *Scytophyllum persicum* aus der obertriassischen Flora des Nord-Iran und angrenzender Gebiete. Die Wiederauffindung von Originalmaterial von *Bernoullia waehneri* aus derselben Flora machte eine Revision dieser Art notwendig, da das wiedergefundene Material identisch mit *S. persicum* ist. Daraus resultiert die vorliegende Neukombination *Scytophyllum waehneri* (Stur) nov. comb., denn *B. waehneri* hat Priorität über *S. persicum*. Die Art unterscheidet sich von allen anderen Arten der Gattung *Scytophyllum* durch ihre kleineren Wedel und Fiedern sowie die deutlich sichtbaren Adern zweiter Ordnung, die eine Art Fischgrätenmuster auf der Blattspreite bilden.

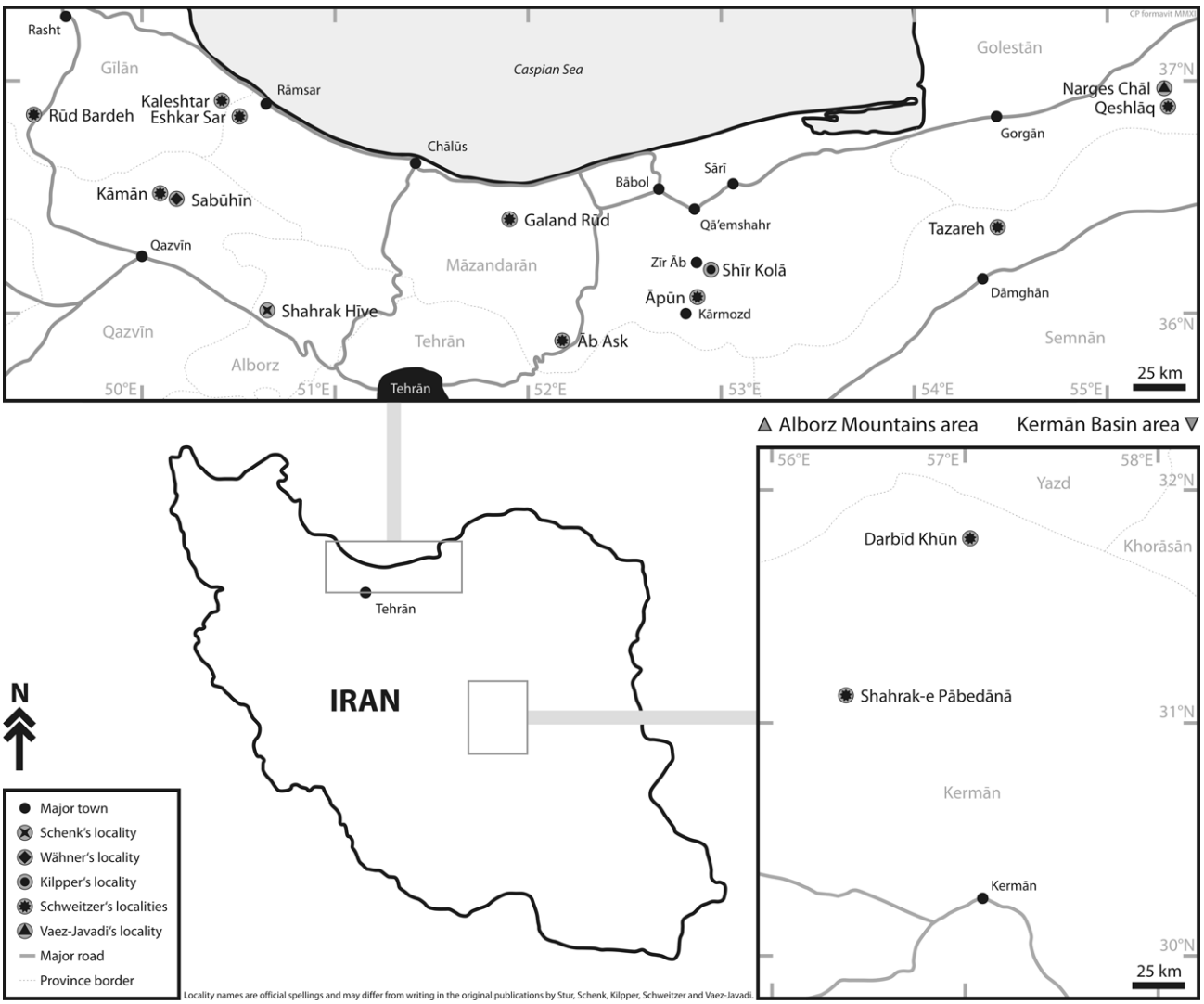
Schlüsselwörter: Alborz, Iran, obere Trias, Rhät, Samenfarn, *Scytophyllum*

1. Introduction

Scytophyllum is a morphogenus used for Mesozoic pteridosperm foliage attributed to the Peltaspermales. The genus is widely distributed in Eurasia with several species (e.g. Dobruskina 1994). Among these, *Scytophyllum persicum* (Schenk) Kilpper, 1975 is a particularly well-known taxon from the Upper Triassic of Iran (e.g. Dobruskina 1994; Schweitzer & Kirchner 1998). However, there are nomenclatorial problems adhering to this taxon that, for proper use of the species, require clarification.

The basionym of *Scytophyllum persicum* is *Pecopteris persica* Schenk, 1887; the type material, however, was later assigned to the genus *Scytophyllum* by Kilpper (1975) based on macromorphology, venation pattern and epidermal anatomy. Nevertheless, it has been ignored or overlooked that Stur (1886) described similar foliage under the name *Bernoullia waehneri* based on specimens collected by Franz Wähner in Iran. The study by Schweitzer & Kirchner (1998), which includes the first description of epidermal anatomy, is based on freshly collected material from Iran, as well as Kilpper's (1975) original material. The original specimens used by Stur (1886), however, were not re-studied because Schweitzer & Kirchner (1998) were unsuccessful in locating them. Part of the original material has recently been rediscovered and demonstrates that the specimens originally assigned to *Bernoullia waehneri* by Stur (1886) are identical to Schenk's *Pecopteris persica*, as had already been suggested by Krasser (1891). Consequently, *Pecopteris persica* and *Scytophyllum persicum* represent junior synonyms of *Bernoullia waehneri* Stur, 1886.

The generic assignment of the foliage in question to *Scytophyllum* by Kilpper (1975) is correct, thus making it necessary to propose a new combination, *Scytophyllum waehneri* (Stur) nov. comb., with the basionym *Bernoullia waehneri* Stur, 1886. In this pa-



Textfigure 1: Map of Iran with details of Northern Iran (Alborz Mountain Area) and central Iran (Kermān Basin Area), showing the sample localities visited and collected by the different collectors/authors mentioned in the text.

per, we describe the species in detail and compare it with the other *Scytophyllum* species.

2. Material and methods

The material of *Bernoullia waehneri*, which was collected during an expedition to Sabūhūn, northern Iran, by Franz Wähner (Textfig. 1), was subdivided into two sets of specimens, one stored at the Museum of Natural History in Vienna, Austria, and the other in the geological collection of the University of Vienna, Austria (Krasser 1891). The holotype, which was kept in the latter collection (Krasser 1891), unfortunately has been lost (Reinhard Zetter, personal communication 2010). Today, only the material kept in the Museum of Natural History Vienna is available for study. The slabs are labelled "leg. Wähner u. Polak". Since these names refer to the same persons as indicated by Stur (1886), this material appears to be the set that formed the basis for Stur's (1886) description, and therefore the lectotype designated in this paper has been chosen from these specimens. The original material of *Pecopteris persica* could not be located.

In the 1960s and 1970s, new collections were made by Karl Kilpper and Hans-Joachim Schweitzer during several expeditions to Iran; part of Kilpper's material is stored in the Ruhr Museum Essen, Germany, while Schweitzer's material is deposited in the Swedish Museum of Natural History, Stockholm, Sweden (prefix S), as well as in a separate collection from the Friedrich-Schiller-University Jena Germany, that is on permanent loan to the Swedish Museum of Natural History (prefix JE-Sch). This material comes from localities adjacent to the locality from where Wähner and Schenk collected their material (see Textfig. 1), and will be considered as well (for details, see Schweitzer & Kirchner 1998). The Kilpper and Schweitzer material is better preserved and more complete than the historic specimens; moreover, the newer specimens have yielded well preserved cuticles.

Macrofossils were studied under a dissecting microscope. Cuticles were isolated from the sediment with hydrofluoridic acid (HF) and prepared using the maceration technique according to Schulze ($KClO_3$ and 30% HNO_3/neutralisation in 5% ammonium hydroxide). Images were captured with digital system cameras (e.g. Nikon D90), while microscopical images were taken using a Leica DLMB microscope with mounted Leica DFC 300 digital camera and an Olympus BX-51 microscope with mounted Olympus DP-71 digital camera. All images, preparations and slides are stored at the Swedish Museum of Natural History, Stockholm, Sweden.

Institutional abbreviations: RE, Ruhr Museum Essen (the former Ruhrlandmuseum), Germany; NRM, Swedish Museum of Natural History, Stockholm, Sweden; NHMW, Museum of Natural History, Vienna, Austria.

3. Systematic palaeobotany

Scytophyllum waehneri (Stur, 1886) nov. comb.

.	1886	*Bernoullia waehneri* sp. nov. – Stur: 434–435, no illustration.
.	1887	*Pecopteris persica* sp. nov. – Schenk: 3, pl. 1, figs 5–6, pl. 6, fig. 27a, pl. 9, fig. 54.
.	1891	*Bernoullia waehneri* Stur, 1886 – Krasser: 416, 418, 419, no illustration.
.	1891	*Pecopteris persica* Schenk, 1887 – Krasser: 419, no illustration.
*v	1975	*Scytophyllum persicum* (Schenk) nov. comb. – Kilpper: 146–148, pl. 1, fig. 1, textfig. 4A–C.
.	1994	*Scytophyllum persicum* (Schenk) Kilpper, 1975 – Dobruskina: 81, 200, 202, 315, 317, no illustration.
*v	1998	*Scytophyllum persicum* (Schenk) Kilpper, 1975 – Schweitzer & Kirchner: 20–22, pl. 2, figs 1–2, pl. 3, figs 1–11, textfigs 2, 3.
.	2006	*Scytophyllum persicum* (Schenk) Kilpper, 1975 – Vaez-Javadi: 402, pl. 1, fig. 1, textfig. 4A.

Basionym: *Bernoullia waehneri* Stur, 1886, in Stur, Vorlage der von Dr. Wähner aus Persien mitgebrachten fossilen Pflanzen, 434–435.

Lectotype: NHMW 2010/0107/0002 (Pl. 1, Figs 1, 2), here designated.

Epitype: NRM JE-Sch1294 (Fig. 3A), here designated.

Type locality: Sabūhīn near Qazvīn, NW of Tehrān, N-Iran.

Age: Rhaetian, Late Triassic.

Repository: Museum of Natural History, Vienna, Austria (NHMW), and Swedish Museum of Natural History, Stockholm, Sweden (NRM).

Material/Repository: Twelve specimens belonging to the original collection of Wähner (NHMW 1887/0005/0033, 1887/0005/0035A/B, 1887/0005/0038, 1887/0005/0050, 2010/0107/0001–0008); fifteen specimens belonging to the collection of Schweitzer (NRM S080030, S080031, S136114, S136115, S136121, S136122, S136123, S136152, JE-Sch1294, JE-Sch1303, JE-Sch1306, JE-Sch1384, JE-Sch1441, JE-Sch1667, JE-Sch1767). Ten specimens from the original collection of Kilpper are also included in the study (RE A0052–0056, RE A0068–0072).

Description of the Wähner/Stur material: Frond fragments up to 140 mm long and 75 mm wide; the fragments probably correspond to approximately half of the leaf. Small, lanceolate pinnae (30–60 mm long and 7.5–10 mm wide; Pl. 1, Figs 1–3, 6, 8) arise from the rachis [2.5 mm (apically) to 4 mm (basally) wide; Pl. 1, Figs 4, 5, 7]. Pinnae basally constricted, and characterized by a coriaceous lamina and a generally entire margin, which is slightly undulate in proximal pinnae (Pl. 1, Fig. 5). Midrib distinct, lateral veins given off at angles of ~50° and proceeding to the margin in a slightly arcuate way, dividing the pinnae into segments. Apical pinna fragments up to 12 mm long and 5 mm wide (Pl. 1, Fig. 4).

Description of the Kilpper/Schweitzer material: Frond fragments up to 255 mm long and 170 mm wide. Axis 3.7 mm wide at the basis, but decreasing in width to 1.5 mm apically; axis surface sometimes somewhat sculptured. Basal pinnae 26–54 mm long and 9–13.5 mm wide (Pl. 2, Figs 1, 2; Pl. 3, Fig. 1); subsequent pinnae gradually becoming larger (up to 94 mm long and 19 mm wide; Pl. 2, Figs 1, 2; Pl. 3, Fig. 1), while apical pinnae again are relatively small (i.e. 30x8 mm). Pinnae apically pointed or slightly rounded (Pl. 3, Fig. 3), basiscopically decurrent and with an undulate margin (Pl. 3, Figs 4, 5). Lateral veins arcuate, given off from prominent midrib at acute angles (40–50°) and proceeding to the margin (Pl. 3, Figs 4, 5). Pinnae showing round depressions close to the midrib (Pl. 3, Fig. 4).

Description of the epidermal anatomy/cuticle: Leaves typically hypostomatic, but occasionally amphistomatic; stomata in the adaxial epidermis of amphistomatic leaves restricted to areas along the veins. Cuticles very robust (Pl. 4); the leaves have probably had a leathery appearance. Costal and intercostal fields differentiated in both sides (Pl. 4, Figs 1, 2). Adaxial epidermis consisting of rows of narrow, elongate epidermal cells over the veins (Pl. 4, Fig. 2); cells over the midrib are more robust. Epidermal cells of intercostal fields very small, isodiametric, trapezoid and irregularly arranged (Pl. 4, Fig. 4). A few stomata may occur along, close to and over the veins, but stomata are absent from the intercostal fields (Pl. 4, Figs 2, 4). Papillae, hairs and tricho-

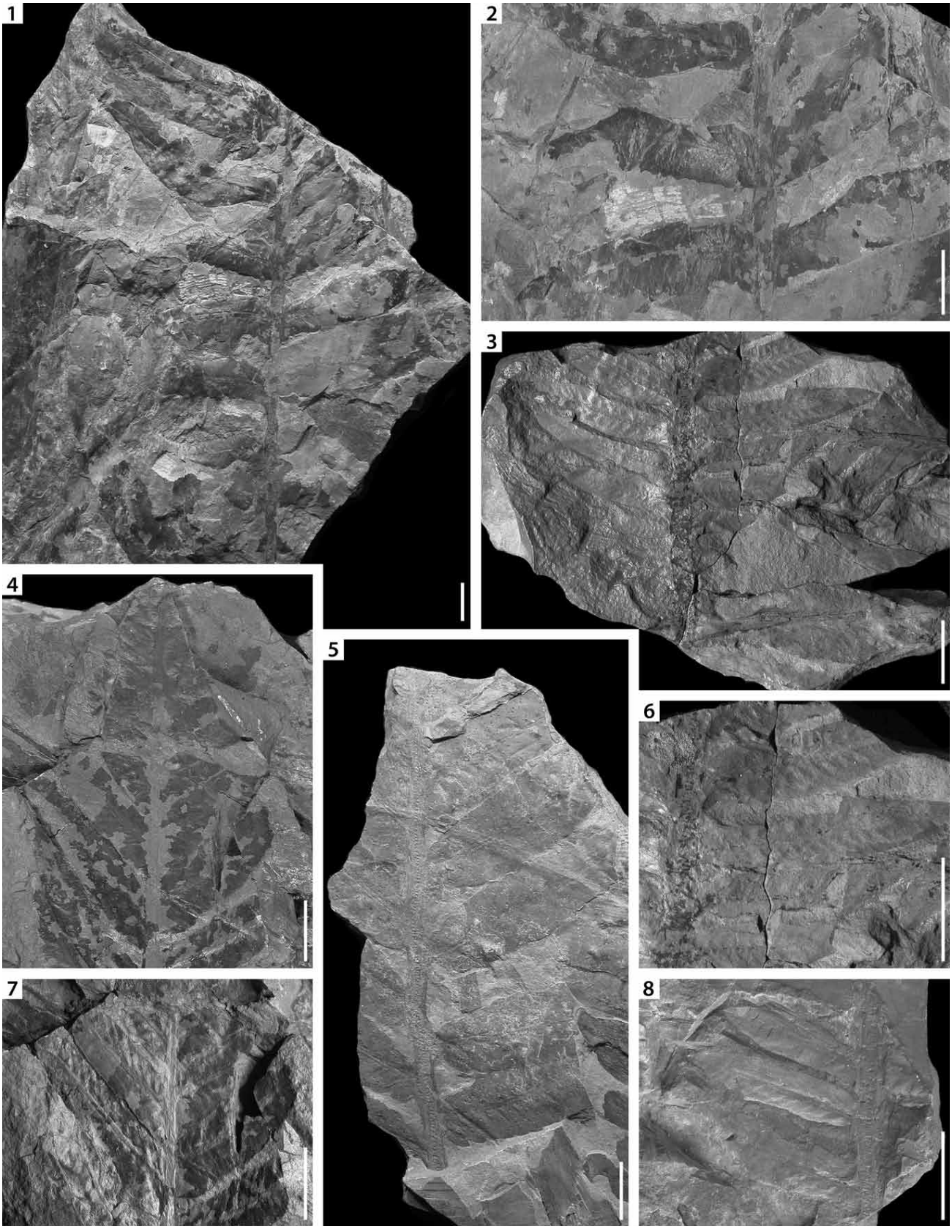


Plate 1: *Scytophyllum waehneri* collected by F. Wähner from the Rhaetian of Shahrak Hīve and Sabūhīn near Qazvīn; all specimens in the collections of the Natural History Museum Vienna. **(1)** Median portion of a frond, NHMW 2010/0107/0002 (lectotype). **(2)** Detail of upper portion of lectotype. **(3)** Median portion of frond showing details of pinna structure, NHMW 2010/0107/0005. **(4)** Apical portion of a frond, NHMW 2010/0107/0001. **(5)** Median portion of a frond with well-preserved details of pinna margin, NHMW 1887/0005/0035. **(6)** Detail of specimen illustrated in Pl. 1, Fig. 3. **(7)** Frond portion from directly below the apex with details of the pinnae, NHMW 2010/0107/0001. **(8)** Detail of frond with some pinnae, NHMW 1887/0005/0038. Scale bars – 1 cm.

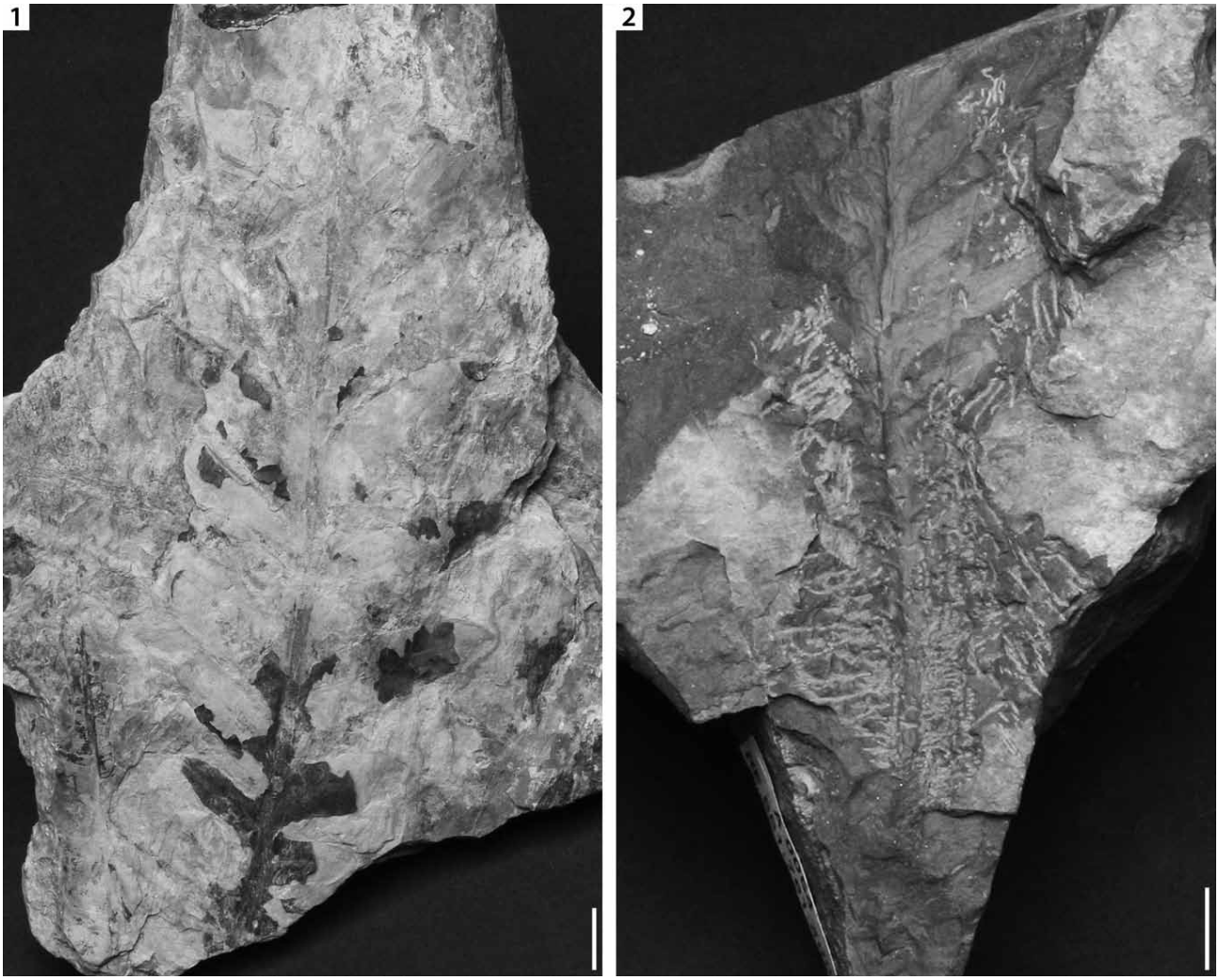


Plate 2: *Scytophyllum waehneri* collected by K. Kilpper from Shīr Kolā near Zīr Āb/Kārmozd; all specimens in the collections of the Ruhr Museum Essen. **(1)** An originally almost complete frond (cf. Kilpper 1975: pl. 1, fig. 1; textfig. 4A), RE A0052. **(2)** Basal portion of a frond (cf. Kilpper 1975: textfig. 4C), RE A0054. Scale bars – 1 cm.

mes have not been observed on ordinary epidermal cells. Anticlinal and periclinal cell walls straight and smooth, but thick. Abaxial cuticle (Pl. 4, Figs 2, 3) thinner than adaxial cuticle. Epidermal cells overlying the veins elongate and narrow, arranged in rows (Pl. 4, Fig. 1); epidermal cells over the midrib are considerably more robust than cells over lateral veins. Epidermal cells of intercostal fields small, isodiametric, trapezoid and irregularly arranged (Pl. 4, Fig. 3). A few stomata are scattered along, close to and over the veins in the same number as in the adaxial cuticle; stomata occur also over the midrib (Pl. 4, Fig. 1). Stomata in intercostal fields rather densely spaced, with individual stomata often sharing subsidiary cells; stomata regularly distributed (Pl. 4, Fig. 3). Papillae, hairs and trichome bases have not been observed on the ordinary epidermal cells; anticlinal and periclinal cell walls straight and smooth. Stomal architecture and shape similar on adaxial and abaxial sides. Stomata randomly oriented and surrounded by a ring of usually six trapezoid subsidiary cells (but up to ten may occur as well), each with a solid papilla overarching the pit (Pl. 4, Figs 5–10). Guard cells deeply sunken below the level of the epidermis on adaxial side; less deeply sunken in abaxial epidermis. Guard cells elongate, kidney-shaped, with heavily cutinized central portions of the dorsal and ventral walls and weakly cutinized polar ends. Stomata in intercostal fields on abaxial side usually surrounded by a ring of encircling cells; however, this ring is not always well recognizable (Pl. 4, Figs 3, 10).

Remarks: Kilpper (1975) considered the foliage to be bipinnate. However, although the margins of the pinnae may be deeply incised, and thus may give the appearance of second order pinnules, we consider the fronds once pinnate, as Schweitzer & Kirchner (1998) have suggested as well.

The name *Bernoullia waehneri* was introduced by Stur (1886) based on a single specimen among material collected in northern Iran (Textfig. 1). The specimen was assigned to the genus *Bernoullia* ba-

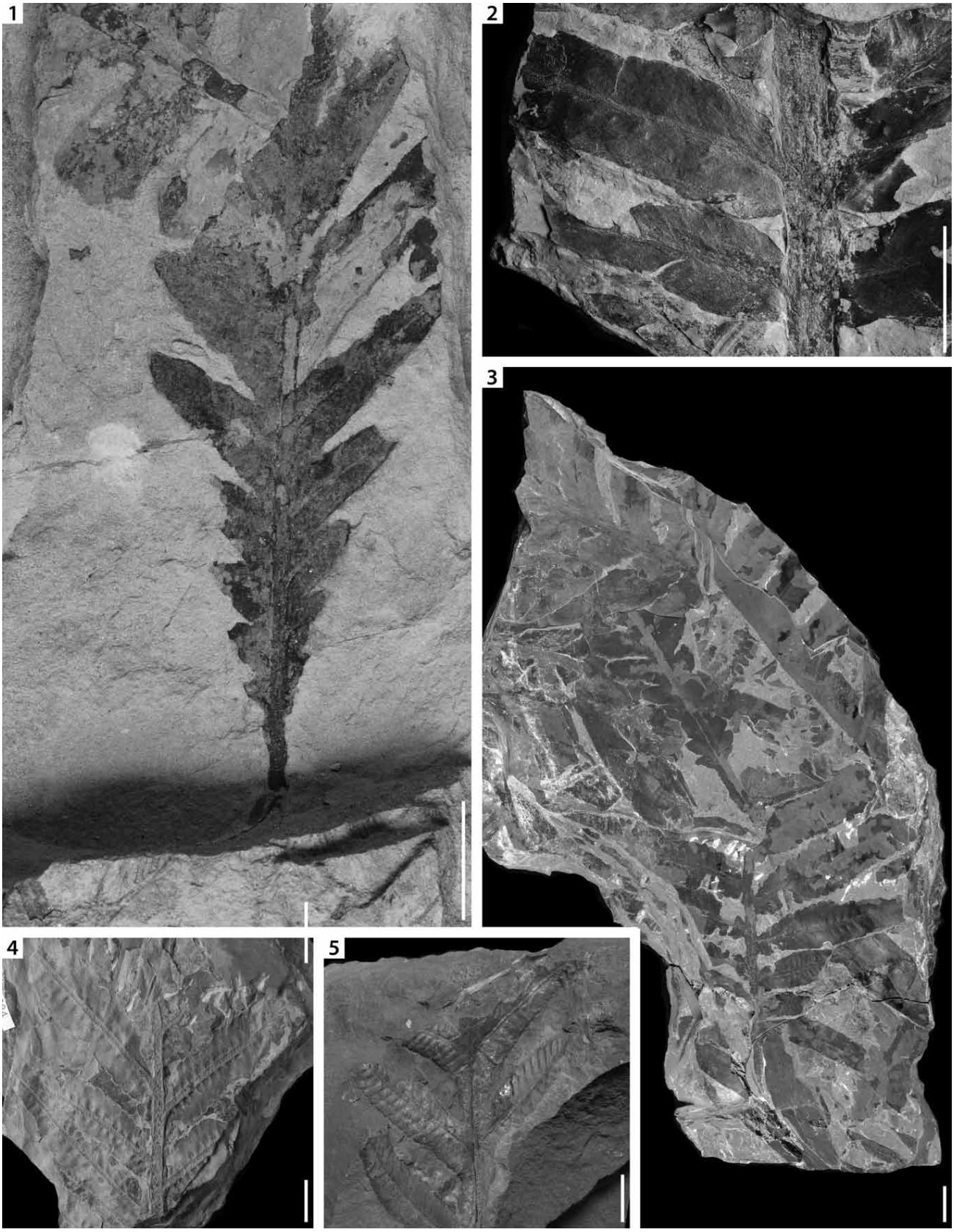


Plate 3: *Scytophyllum waehneri* collected by H.-J. Schweitzer from the Rhaetian of Māzandarān, Āpūn Valley, Eshkar Sar near Rāmsar, and Darbīd Khūn and Kermān, Kermān Basin; all specimens in the collections of the Swedish Museum of Natural History, Stockholm. **(1)** Basal portion of a frond, JE-Sch1294. **(2)** Close-up of pinnae from a median frond portion, JE-Sch1306. **(3)** Slab with several frond portions lying on top of each other, NRM S136121. **(4)** Detail of median portion of a frond showing details of pinnae, NRM JE-Sch1384. **(5)** Detail of distal frond portion showing details of venation and pinnae, NRM S080031. Scale bars – 1 cm.

sed on similarities with fossils published previously as *B. helvetica* Heer, 1877 and *B. lunzensis* Stur, 1885. Stur (1886) considered these latter *Bernoullia* species to be closely related to *B. waehneri* based on the organisation of the pinnae (*B. helvetica*), or even to be almost identical (*B. lunzensis*). The Wähner collection was considered lost during the last century, but a part of it has recently been re-discovered in the Museum of Natural History in Vienna. In the meantime, *B. lunzensis* and *B. helvetica* had been transferred to the genus *Symopteris* (Xu et al. 1979; Kustatscher et al. 2011) because the name *Bernoullia* was pre-occupied by a genus of extant plants.

It became evident during work on *Symopteris* (Kustatscher et al. 2011) that the material from Iran cannot be identified with *Bernoullia*/*Symopteris*, and best be assigned to *Scytophyllum*. According to Krasser (1891), the material assigned to *B. waehneri* is conspecific with specimens assigned to *Pecopteris persica* by Schenk (1887), who probably was not aware of the description of *B. waehneri* given by Stur (1886). However, apparently also unaware of *B. waehneri*, Kilpper (1975) assigned *P. persica* to the genus *Scytophyllum* as well, and introduced the new combination *Scytophyllum persicum* based on macromorphology and epidermal structure.

After re-study of the original Wähner material, we consider *Bernoullia waehneri* and *Pecopteris persica*/*Scytophyllum persicum* conspecific. Consequently, the two latter names represent junior synonyms of *B. waehneri* (see Krasser 1891), and according to the requirements of the ICBN (McNeill et al. 2006), the species has to be formally named *Scytophyllum waehneri*. Schweitzer & Kirchner (1998) described the species in detail based on Kilpper's specimens and new material from Iran. Schweitzer & Kirchner (1998), unable to re-investigate Wähner's original material, considered the specimens different from *Scytophyllum persicum* based on a short statement in Krasser (1891) that addresses differences with regard to the mrophology of the pinna basis between the two taxa. Several of the specimens studied by Krasser (1891) and Schweitzer & Kirchner (1998) come from localities close to each other (see Textfig. 1), and thus the minute differences noted by Krasser (1891) may well represent intraspecific variation or preservational artefacts. As a result, the specimens collected by Wähner, Kilpper, and Schweitzer represent the same species.

The record of *Scytophyllum waehneri* from the Norian–Rhaetian Vomar Formation at the river banks of the Kokuybel' River in Central Pamir, Tajikistan (Dobruskina 1994) remains questionable, since the specimen(s) have not been published or otherwise made available to date. Dobruskina (1994) only mentioned this species in the plant collections disposed to the authors of this paper. This record apparently comes from ~2000 km East of the main distribution of *Scytophyllum waehneri* (Textfig. 1), and we therefore question Dobruskina's identification.

Distribution: Rhaetian of Iran, Alborz Mountains, north of Tehrān close to the coast of the Caspian Sea and Kermān Basin, north of Kermān (Textfig. 1) (Stur 1886; Schenk 1887; Kilpper 1975; Schweitzer & Kirchner 1998; Vaez-Javadi 2006).

4. Discussion

Scytophyllum waehneri differs from *S. bergeri* Bornemann, 1856 from the Middle Triassic of the Germanic Basin and the Dolomite, by its smaller frond and pinna size, as well as by the presence of distinct secondary veins in *S. waehneri* that form a fishbone pattern on the lamina. *Scytophyllum dentatum* Bornemann, 1856, *S. dubium* Compter, 1922 and *S. apoldense* (Compter) Linnell, 1933 are junior synonyms of *S. bergeri* (Kustatscher et al. 2007; Kustatscher and Van Konijnenburg-van Cittert 2010).

Scytophyllum pamiricum (Sixtel) Dobruskina, 1982 from the Norian–Rhaetian of Pamir is the species that most closely resembles *S. waehneri*. The only differences lie in the slightly larger size of the fronds of *S. pamiricum* and in the presence of a larger number of small pinnae at the base of the frond. However, these features may well fall within the intraspecific variability. The slightly constricted pinna bases and the venation are similar in both species (Sixtel 1960). Unless details of the epidermal anatomy of *S. pamiricum* become available, we cannot decide as to whether the two taxa represent separate species or are conspecific. In case of the latter, the name *S. waehneri* would have priority.

In her synopsis of Triassic floras of Eurasia, Dobruskina (1994) mentioned 28 species of *Scytophyllum* from different localities in the Northern Hemisphere (predominantly from several states of the former USSR), including those mentioned above. Most species come from the Upper Triassic of the Pechora River, Russia (Dobruskina 1969, 1980, 1994; Chramova 1977), but some have also been reported from the Ilek River at the southern end of the Urals (Dobruskina 1994). Most of the Pechora species clearly differ from *S. waehneri* by bearing papillae on normal epidermal cells. The only species lacking papillae on ordinary epidermal cells is *S. neuburgianum* Dobruskina, 1969, which, however, differs from *S. waehneri* in the absence of papillae also on the subsidiary cells, and by being more clearly amphistomatic.

Apart from *Scytophyllum bergeri* and *S. pamiricum*, few *Scytophyllum* species have been described from regions outside the Pechora basin. *Scytophyllum chaoyangense* Zhang et Zheng, 1984 from the Upper Triassic Laohugou Formation of Western Liaoning, China, is known from a few fragments only, and is comparable to *S. waehneri* with regard to frond size, but the venation is more fasciculate. The epidermal anatomy of *S. chaoyangense* remains unknown to date (Zhang & Zheng 1984). *Scytophyl-*

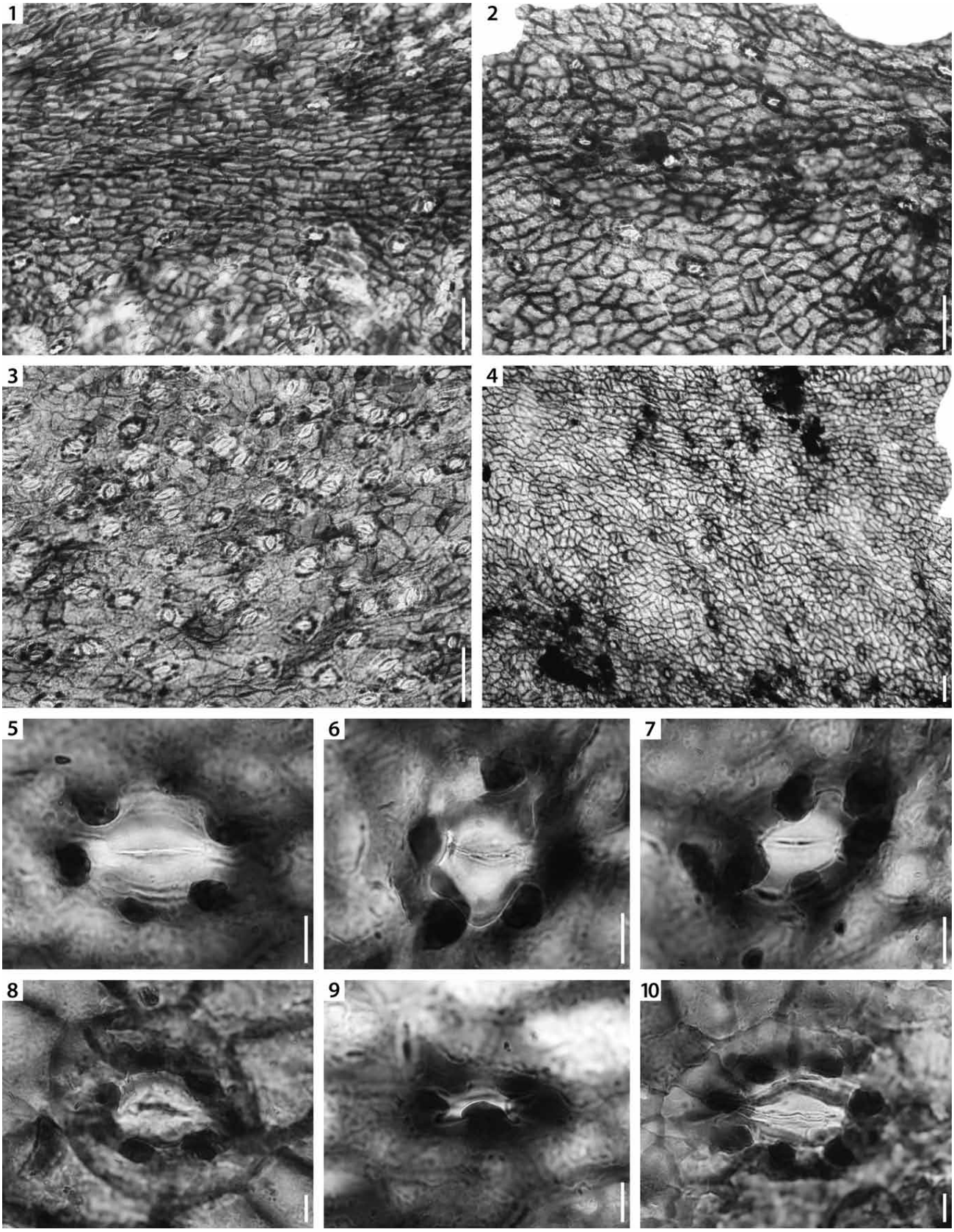


Plate 4: Cuticles from specimens collected by H.-J. Schweitzer at Māzandarān, Āpūn Valley, and Kermān, Kermān Basin; all specimens and slides in the collections of the Swedish Museum of Natural History, Stockholm. **(1)** Abaxial cuticle showing vein and intercostal field portions at the top and bottom, from specimen JE-Sch1306. **(2)** Vein expression in adaxial cuticle, with intercostal field portions at the top and bottom, from specimen JE-Sch1304. **(3)** Detail of an intercostal field on an abaxial cuticle with distribution and arrangement of stomata, from specimen JE-Sch1304. **(4)** Detail of an intercostal field on an adaxial cuticle with distribution and arrangement of stomata, from specimen JE-Sch1304. **(5–10)** Details of stomata showing sunken guard cells and papillae on subsidiary cells, from specimen JE-Sch1304. Scale bars – 100 µm in 1–4, 10 µm in 5–10.

lum pinnatum (Sixtel) Dobruskina, 1975 from the Triassic of Madygen (Kyrgyzstan) and *Scytophyllum tenuinerve* Mogucheva, 1973 from the Lower Triassic at the Lower Tunguska River, Taimyr (Eastern Siberia), closely resemble S. bergeri in gross morphology; however, the absence of information on the epidermal anatomy of the former taxa renders a more detailed comparison impossible (see also Dobruskina 1975). Notwithstanding the lack of cuticle data, the two taxa are distinctly different from *S. waehneri*. *Scytophyllum karevae* Kirichkova, 1969 from the Ladinian–Carnian of the Eastern Urals differs from *S. waehneri* in having large, almost dentate pinnae and papillae on the normal epidermal cells. In *Scytophyllum vulgaris* (Prynada ex Vladimirovitch) Kirichkova et Chramova, 1980 from the Ladinian–Carnian of the Eastern Urals, the epidermal cells are polygonal, larger (i.e. 40–50x50–70 µm) than those seen in *S. waehneri* (elongated over the veins) and bear small papillae. While the stomata in *S. waehneri* are located close to or sometimes even over the veins, they are arranged between the veins in *S. vulgaris*. Moreover, in the latter taxon they are very small and occasionally in contact; the number of subsidiary cells is four to six against six in *S. waehneri*, and the subsidiary cells do not bear papillae, which is quite extraordinary for a *Scytophyllum* species. Where cuticles are known from *Scytophyllum* species, they are always rather robust and demonstrate that normal epidermal cells as well as the subsidiary cells usually possess papillae

5. Summary

Scytophyllum is an important Triassic seed fern genus that currently consists of more than 28 formally described species. The discovery of part of the original Wähner collection containing *Bernoullia waehneri* evidenced the priority of this name over the currently used names *Pecopteris persica* and *Scytophyllum persicum*. Since the Wähner specimens undoubtedly belong to the genus *Scytophyllum*, the new combination *Scytophyllum waehneri* (Stur) nov. comb. is proposed. *Scytophyllum waehneri* is a typical element of Rhaetian floras of Iran, but the majority of species of the genus during the Late Triassic occurred in regions far east of the later Urals (i.e. Central Asia, Siberia, China), while the Middle Triassic members of the genus have been reported from areas west of the later Urals. A thorough revision of the *Scytophyllum* species is needed to obtain a more accurate picture of the variability and distribution of the various species throughout the Northern Hemisphere.

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